Workshops on
MORE DATA IS BETTER
An introduction to Scientific Machine Learning: from DATA to PINN

prof. Armando Di Nardo (Università della Campania Luigi Vanvitelli)
prof. Salvatore Cuomo (Università di Napoli Federico II)

The possibility collecting big data with ICT and IoT technologies opened a new era for humankind and offered to scientists and operators novel amazing challenges. In the past, a great amount of data represented for engineers a problem to face, requiring too space for storage, too computational power and too complex simulation models. In the last recent years, these issues are changed and a novel paradigm can be proposed: More data is Better!
Scientific Machine Learning (SciML) has emerged as a powerful tool for solving partial differential equations (PDEs) and addressing a wide spectrum of real-world issues. This surge in interest has led to a reassessment and rethinking of traditional numerical methods, highlighting the need for more efficient and reliable approaches that integrate both model-driven and data-driven methodologies.
In this context, Physics-Informed Neural Networks (PINNs) are novel deep learning frameworks for solving forward and inverse problems associated with nonlinear PDEs. Although PINNs have showcased remarkable effectiveness, several emerging Artificial Intelligence (AI) methodologies warrant consideration in addressing even more intricate and demanding applications. In this presentation, we will explore some novel theoretical and applied challenges related to the fascinating world of AI as it intersects with SciML.

Tuesday October 1 2024
from 15.00 to 17.00 on-line and on-site in Classroom 10C

Introduction of Data Management
Prof. Armando Di Nardo

Basics of Matlab and Python for Data Management
Dr. Ludovica Palma
Prof. Armando Di Nardo

Tuesday October 8 2024
from 14.30 to 18.30 on-line and on-site in Classroom 10C

Basics of Artificial Intelligence: Neural Networks and Machine Learning
Dr. Vittorio Bauduin
Prof. Armando Di Nardo

Applications of AI in Python
Dr. Vincenzo Schiano di Cola
Dr. Vittorio Bauduin

Tuesday October 29 2024
from 14.30 to 18.30 on-line and on-site in Classroom 10C

Introductions to Scientific Machine Learning and to Physics Informed Neural Networks
Prof. Salvatore Cuomo
Prof. Armando Di Nardo

Applications of PINN in Python
Dr. Vincenzo Schiano di Cola
Dr. Vittorio Bauduin

Thursday November 14 2024
from 14.30 to 18.30 on-line and on-site in Classroom 10C

Techniques of Data Clustering
Prof. Armando Di Nardo

Applications of Data clustering in Matlab
Dr. Ludovica Palma
Prof. Armando Di Nardo

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